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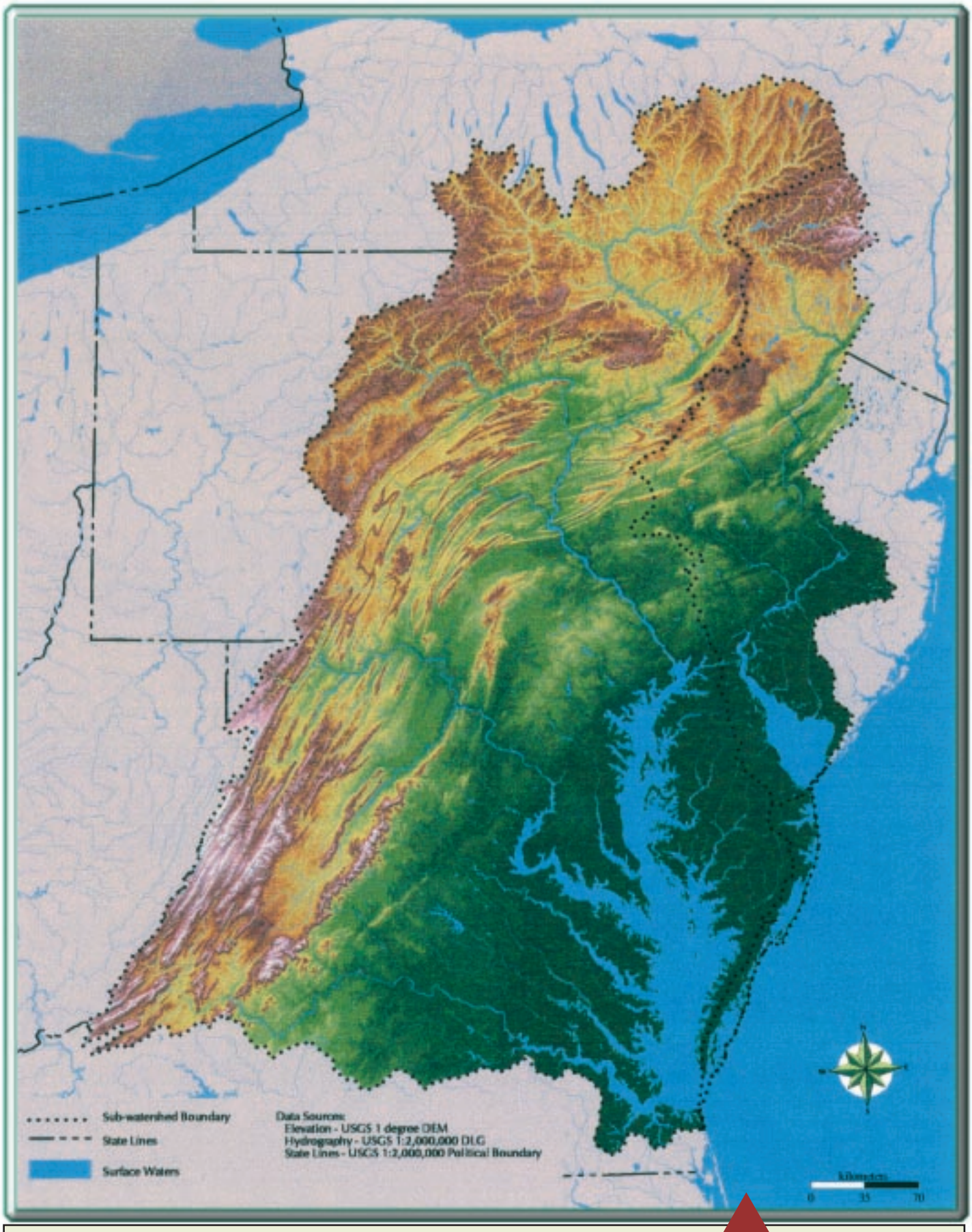
Condition of the Mid-Atlantic Estuaries



Watershed of the Mid-Atlantic estuaries

Greetings from the U.S. Environmental Protection Agency

Chesapeake Bay, Delaware Estuary, and Delmarva coastal estuaries are vital Mid-Atlantic resources. They provide habitat for many kinds of animals and plants, including commercially valuable fish and shellfish, and are enjoyed each year by millions of recreational boaters, fishermen, and other visitors. For many years, the U.S. Environmental Protection Agency (EPA) has led efforts to protect and restore these estuaries by implementing such laws as the Clean Water Act and by participating in projects like the Chesapeake Bay Program.

Are these protective measures having an impact? What is the current condition of our natural resources? How widespread are ecological problems and what are their probable causes? To answer these questions, and to identify the most effective protection measures for the future, we need to regularly take stock of our natural resources. EPA is now pursuing these goals by preparing a series of State-of-the-Region Reports for the Mid-Atlantic, of which this report is the first. These peer-reviewed reports aim to gather and evaluate the best available scientific information and knowledge about the ecological resources of the region. Future reports will address the condition of our streams, forests, and other resources.

This report breaks new ground in employing the latest scientific tools and by drawing upon carefully designed sampling plans that provide broad coverage of all of these estuaries. It also demonstrates the value of forging close scientific collaboration among federal and state agencies and other organizations. We hope this report will help you understand more about the estuaries and encourage further efforts to protect these natural treasures.

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Regional Administrator
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Acknowledgements

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Because of the vast number of different research projects producing the data used in this report, no attempt was made to verify the quality of these data. It was assumed that if the data were published or were stored in established databases that they had been verified. However, any data that appeared "unusual" or questionable were checked with the originator of those data. The spatial displays presented in this report were not prepared to meet EPA spatial locational guidelines; the displays were prepared from disparate datasets and represent a best attempt at approximating locations.

This report has been reviewed and approved for publication by the U.S. Environmental Protection Agency. Approval does not signify that the contents necessarily reflect the views and/or policies of the EPA. Mention of trade names, products, or services does not convey, and should not be interpreted as conveying, official EPA approval, endorsement, or recommendation.

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Executive Summary

Estuaries are transitional zones where salt water from the sea mixes with fresh water flowing off the land. Estuaries in the Mid-Atlantic Region provide habitats for many birds, mammals, fish, and other aquatic life. They also are important assets that humans use in a wide variety of ways. This report focuses on the current condition of the Mid-Atlantic estuaries (circa early to mid 1990s) and, where information is available, how the estuaries have changed over the years and why.

The pervasive issues across the **Mid-Atlantic Region** include the oyster harvest and disease in shellfish. Shellfish, particularly the American oyster, traditionally have been one of the major living resources harvested in the Mid-Atlantic states. Oyster harvests have declined from a high of 133 million pounds in 1880 to today's annual catch of about one million pounds. Disease, specifically Dermo and MSX, appears to be one of the major causes of the recent drastic decline in oyster populations in Chesapeake Bay and the Delaware Estuary, with over-harvesting and pollution also playing a major role in Chesapeake Bay. Although no immediate solution to the problem is known, researchers currently are working on the concept of introducing disease-resistant strains of oysters to the Mid-Atlantic. With the decline of the oyster industry, the most important shellfish industry in the Mid-Atlantic Region is now the blue crab. However, the significantly increased fishing pressure on the already heavily exploited population is beginning to take its toll. To avoid a serious impact, both Maryland and Virginia have placed restrictions on crabbing in Chesapeake Bay waters.

The **Delaware Estuary** is characterized by an historical lack of submerged aquatic vegetation (SAV), due predominantly to naturally-occurring low water clarity. It is also one of the most nutrient enriched estuaries in the world, although harmful phytoplankton blooms are held in check by other factors, including low water clarity. The estuary also is highly impacted by lingering toxic contaminants associated with urbanization and industrialization of the Delaware River. The Delaware Estuary has some of the nation's highest levels of chemical contaminants in fish and shellfish. Fishing

Photo by: U.S. Fish and Wildlife Service

bans or advisories on the consumption of finfish are posted for parts of the estuary because of elevated PCB concentrations. Concentrations of Chlordane in fish exceeding the FDA action level have been reported in the upper estuary.

Chesapeake Bay continues to be affected by low dissolved oxygen and is the most hypoxic estuary in the region. Low dissolved oxygen levels are associated with

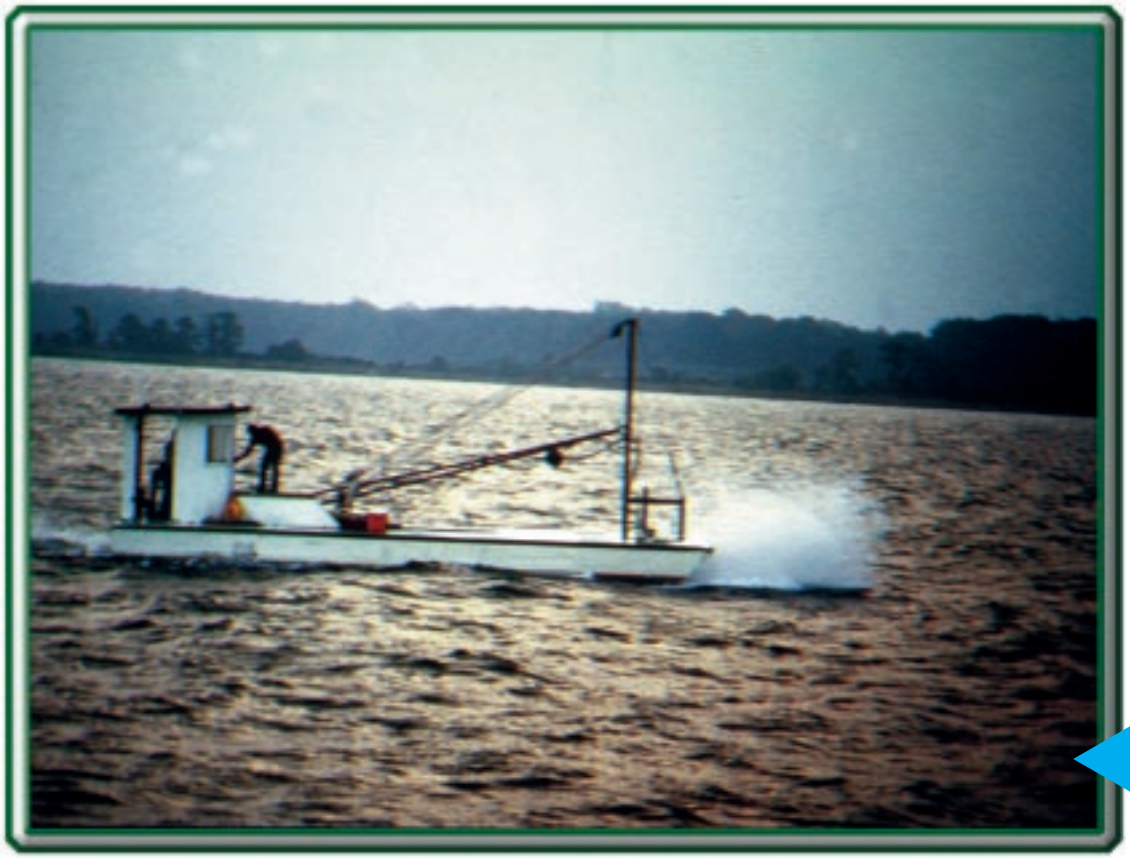

Photo by: U.S. Fish and Wildlife Service

nutrient overenrichment and eutrophication. In 1987, the Chesapeake Bay Agreement stipulated a 40% reduction in nutrient loading by the year 2000. Nutrient levels in Chesapeake Bay are declining in response to improved wastewater management practices, implementation of best management practices on agricultural lands (nitrogen), and bans on certain types of detergents (phosphorus). However, there has been more success in controlling point sources than nonpoint sources of nutrients. Historically, high nutrient concentrations have contributed to prolonged phytoplankton blooms in the Bay. Blooms during the 1970s and 1980s significantly reduced water clarity and, as a result, contributed to the massive loss of SAV that occurred during that time period. This critical habitat has since partially recovered.

The **Delmarva coastal bays** are the least degraded systems in the Mid-Atlantic Region but are threatened by encroaching urbanization. These bays are moderately enriched, particularly in Delaware, largely from agricultural sources. Eutrophication is increasingly noticeable in the dead-end canals along developed shorelines in the Delmarva coastal bays. SAV historically has been absent from the Delaware portion of the coastal bays because of high natural turbidity in these systems. Species composition of shore zone fish in the Delaware coastal bays indicates impacted environmental conditions. In contrast, Maryland coastal bays' species composition suggests a healthy habitat; however, researchers have observed evidence of early stages of degradation in northern areas.

Coastal waters presently exhibit low levels of nutrients and chlorophyll. However, evidence suggests that these levels may be rising, indicating the potential for future environmental problems.

Estuaries of the Mid-Atlantic Region are being adversely affected by man's activities. Therefore they need active management if environmental quality is to be sustained. The states, in conjunction with EPA through the Chesapeake Bay Program and the National Estuary Programs, have instituted successful environmental management programs to address these environmental challenges.

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